

THE VERTEBRATE FAUNA OF THE BASS STRAIT ISLANDS:
2. THE REPTILIA OF FLINDERS AND KING ISLANDS

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Introduction

Main (1961) drew attention to the value of continental islands for deducing changes in animal distributions since the last glacial period, when the sea level was much lower than at present, and the climate colder. Using a similar approach, Littlejohn & Martin (1965) reconstructed the probable post-glacial history of SE. Australia and analysed the amphibian fauna of Flinders Is., King Is., Tasmania and S. Victoria in the light of this reconstruction. They point out that during the last glacial period an extensive landbridge (the Bassian isthmus), incorporating all the present Bass Strait islands, existed between S. Victoria and Tasmania. According to Littlejohn and Martin the probable sequence of the post-glacial submergence of this landbridge was as follows:

16,000	years	before	present:	Eustatic rise in sea level commenced.
14,000	"	"	"	Cape Otway to King Is. link broken.
12,000	"	"	"	Wilsons Promontory to Flinders Is. link broken.
11,000	"	"	"	King Is. to Tasmania link broken.
10,000	"	"	"	Flinders Is. to Tasmania link broken.
6,000	"	"	"	Present coastline attained.

The present paper lists accurate reptile species records for Flinders Is. and King Is. Most of these records are from specimens collected on trips to the islands by members of the University of Melbourne Zoology Department (MUZD); however, three species records are based on specimens in the National Museum of Victoria and one other on literature records alone. Trips were made to Flinders Is. in October 1962 and February 1964, and to King Is. in November 1963 and March 1964.

Species records for S. Victoria and Tasmania are also provided for comparative purposes. The S. Victorian list is based on specimens in the MUZD collection. S. Victoria is taken as the area S. of the Great Dividing Range and, for discussion purposes, has been divided into E. and W. zones by a line passing N.-S. through Melbourne. A Tasmanian species list was compiled from specimens in the MUZD and from literature records, and this basic list was modified by Mr. R. N. Green, Zoologist, Queen Victoria Museum, Launceston and Mr. B. C. Mollison, Inland Fisheries Commission, Hobart, to give the final list. Three species (*Amphibolurus adalaidensis*, *A. muricatus* and *Tiliqua scincoides*) recorded from Tasmania in the most recent account of Tasmanian lizards (Hewer 1948) were deleted by Green and Mollison.

Following the ideas of Main (1961) and Littlejohn & Martin (1965) the data mentioned above can be discussed in three main ways:

1. The nature of the E. and W. sides of the Bassian landbridge can be suggested by comparing the reptile faunas of Flinders Is. and King Is.

2. The present relationships, and hence origin, of the Flinders Is. and King Is. reptile faunas can be suggested by comparison to the reptile faunas of Tasmania and S. Victoria.
3. The occurrence of post-glacial intrusive species in S. Victoria can be inferred by comparing the reptile fauna of Tasmania (and the Bass Strait islands) with that of S. Victoria.

Following the methods of Rawlinson (1966), the zoogeographic position of Tasmania can also be determined. This is achieved by comparing the reptile fauna of Tasmania with that of Gippsland (SE. Victoria), a typical Bassian area (*sensu* Rawlinson 1966).

Littlejohn & Martin (1965) have given general descriptions of Flinders Is. and King Is., discussing physiography, climate and vegetation in detail. They also provide maps of the islands which show all localities mentioned in this article.

Reptile Fauna

As with the amphibians of this area (Littlejohn & Martin 1965), no cryptic species were found on either island. Specimens from the islands were compared to specimens collected on the islands and in five instances, localities of specimens in the National Museum of Victoria; 'Specimens observed', which includes the localities of all reptiles seen but not collected, the main source of such data being road casualties which are designated by 'DOR' (dead on road); and 'Literature records', which includes all literature records which are considered to be accurate. References to small islands adjacent to Flinders or King Islands (e.g. Chappell Is., Furneaux Group; New Year Is., off King Is.) have been listed with localities for the large island. Literature records which are considered to be doubtful are listed with a brief explanation after the conclusion of accurate data for each island. Non-specific references (e.g. Bass Strait islands) have been listed for completeness.

In the following locality records, data for each species are presented under three sub-headings: 'Specimens examined', which includes the localities of all specimens collected on the islands and in five instances, localities of specimens in the National Museum of Victoria; 'Specimens observed', which includes the localities of all reptiles seen but not collected, the main source of such data being road casualties which are designated by 'DOR' (dead on road); and 'Literature records', which includes all literature records which are considered to be accurate. References to small islands adjacent to Flinders or King Islands (e.g. Chappell Is., Furneaux Group; New Year Is., off King Is.) have been listed with localities for the large island. Literature records which are considered to be doubtful are listed with a brief explanation after the conclusion of accurate data for each island. Non-specific references (e.g. Bass Strait islands) have been listed for completeness.

I. FLINDERS ISLAND

AGAMIDAE

Amphibolurus diemensis (Gray)

SPECIMENS EXAMINED: Camerons Inlet, 4 miles E. of The Dutchman, 1 juv.; Walanippi, 7 miles SE. of Whitemark, 1.

SPECIMENS OBSERVED: Nil.

LITERATURE RECORDS: Furneaux Group (Frost 1893 as *Amphibolurus angulifera*); Flinders Is. (Zeitz 1914 as *Amphibolurus angulifera*).

SCINCIDAE

Egernia whitei (Lacépède)

SPECIMENS EXAMINED: South Branch Pats River, 2 miles N. of Whitemark, 1; The Dutchman, 1; Reids Peak, 4½ miles SE. of Whitemark, 1; Mt. Barclay,

5 miles SE. of Whitemark, 4; Walanippi, 7 miles SE. of Whitemark, 1; Mt. Strzelecki, 2; Loccota, 11; Badger Corner, near Loccota, 1.

SPECIMENS OBSERVED: Nil.

LITERATURE RECORDS: Furneaux Group (Frost 1894); Mt. Strzelecki, Flinders Is. (MacKay 1955).

***Leiopisma entrecasteauxi* (Duméril & Bibron)**

SPECIMENS EXAMINED: The Dutchman, 1; Loccota, 1.

SPECIMENS OBSERVED: Nil.

LITERATURE RECORDS: Fisher Is., Furneaux Group (MacKay 1955).

***Leiopisma metallicum* (O'Shaughnessy)**

SPECIMENS EXAMINED: Mcmana, 1; 8 miles NNW. of Whitemark, 10; Nelson Lagoon, 7 miles N. of The Dutchman, 1; North Branch Pats River, 2½ miles N. of Whitemark, 1; South Branch Pats River, 2 miles N. of Whitemark, 1; The Dutchman, 10; 1 mile E. of The Dutchman, 2; Camerons Inlet, 4 miles E. of The Dutchman, 2; Reids Peak, 4½ miles SE. of Whitemark, 1; Walanippi, 7 miles SE. of Whitemark, 10; Loccota, 2; Fisher Is. off Lady Barron, 2.

SPECIMENS OBSERVED: Nil.

LITERATURE RECORDS: Furneaux Group (Frost 1894).

***Leiopisma ocellatum* (Gray)**

SPECIMENS EXAMINED: The Dutchman, 28; Mt. Barclay, 5 miles SE. of Whitemark, 7; Mt. Strzelecki, 1; Trousers Point, ½ mile SW. of Loccota, 1.

SPECIMENS OBSERVED: Nil.

LITERATURE RECORDS: Furneaux Group (Frost 1894); Mt. Strzelecki, Flinders Is. (MacKay 1955).

***Leiopisma pretiosum* (O'Shaughnessy)**

SPECIMENS EXAMINED: Flinders Is., 1 (Specimen D911, National Museum).

SPECIMENS OBSERVED: Nil.

LITERATURE RECORDS: Nil.

***Leiopisma trilineatum* (Gray)**

SPECIMENS EXAMINED: Pats River, 2 miles N. of Whitemark, 1; The Dutchman, 2; Camerons Inlet, 4 miles E. of The Dutchman, 9 eggs (hatched 8.III.64); Mt. Barclay, 5 miles SE. of Whitemark, 2; Loccota, 4.

SPECIMENS OBSERVED: Nil.

LITERATURE RECORDS: Little Dog, Big Dog, Babel and Flinders Islands, Furneaux Group (MacKay 1955).

***Rhodona bougainvilli* (Gray)**

SPECIMENS EXAMINED: Nil.

SPECIMENS OBSERVED: Nil.

LITERATURE RECORDS: Babel Is., Furneaux Group (MacKay 1955).

***Tiliqua nigrolutea* (Quoy & Gaimard)**

SPECIMENS EXAMINED: Trousers Point, ½ mile SW. of Loccota, 1.

SPECIMENS OBSERVED: Whitemark, 1 DOR; The Dutchman, 1 DOR; 4 miles S. of The Dutchman, 1 DOR.

LITERATURE RECORDS: Babel Is., Furneaux Group (MacKay 1955); Flinders Is. (Mitchell 1950); Flinders Is. (Zeitz 1914).

TABLE 1

Summary of reptilian distribution in the Bass Strait area

Species	SE. Victoria	SW. Victoria	Flinders Island	King Island	Tasmania
CHELYIDAE					
<i>Chelodina longicollis</i>	+	+	—	—	—
AGAMIDAE					
<i>Amplibolurus barbatus</i>	—	+	—	—	—
<i>A. diemensis</i>	+	—	+	—	+
<i>A. muricatus</i>	+	+	—	—	—
<i>Physignathus lesueuri</i>	+	—	—	—	—
<i>Tympanocryptis lineata</i>	—	+	—	—	—
GEKKONIDAE					
<i>Phyllodactylus marmoratus</i>	—	+	—	—	—
PYGOPODIDAE					
<i>Delma impar</i>	—	+	—	—	—
SCINCIDAE					
<i>Ablepharus lineocellatus</i>	—	+	—	—	—
<i>Egernia cunninghami</i>	+	+	—	—	—
<i>E. luctuosa</i>	—	+	—	—	—
<i>E. saxatilis intermedia</i>	+	+	—	—	—
<i>E. whitei</i>	+	+	+	+	+
<i>Emoia spenceri</i>	+	—	—	—	—
<i>Hemiergis decresiensis</i>	+	+	—	—	—
<i>Leiopisma delicata</i>	+	—	—	—	—
<i>L. entrecasteauxi</i>	+	+	+	+	+
<i>L. guichenoti</i>	+	+	—	—	—
<i>L. metallicum</i>	+	+	+	+	+
<i>L. mustelinum</i>	+	—	—	—	—
<i>L. ocellatum</i>	—	—	+	—	+
<i>L. pretiosum</i>	—	—	+	—	+
<i>L. trilineatum</i>	+	+	+	+	+
<i>L. weeksae</i>	+	+	+	+	+
<i>Rhondona bougainvilli</i>	+	+	+	—	+
<i>Siaphos maccoyi</i>	+	+	—	—	—
<i>Sphenomorphus lesueuri</i>	—	+	—	—	—
<i>S. quoyi tympanum</i>	+	+	—	—	—
<i>S. sp. nov.</i>	+	—	—	—	—
<i>Tiliqua casuarinae</i>	+	—	—	—	—
<i>T. nigrolutea</i>	+	+	+	+	+
<i>T. rugosa</i>	—	+	—	—	+
<i>T. scincoides</i>	+	+	—	—	—
VARANIDAE					
<i>Varanus varius</i>	+	—	—	—	—
ELAPIDAE					
<i>Demansia textilis</i>	+	+	—	—	—
<i>Denisonia coronoides</i>	+	+	+	+	+
<i>D. flagellum</i>	—	+	—	—	—
<i>D. nigrescens</i>	+	—	—	—	—
<i>D. superba</i>	+	+	+	+	+
<i>D. sp. nov.</i>	+	—	—	—	—
<i>Notechis ater</i>	—	—	+	+	—
<i>N. scutatus</i>	+	+	—	—	+
<i>Pseudechis porphyriacus</i>	+	+	—	—	—
TOTALS	31	30	12	8	14

ELAPIDAE

Denisonia coronoides (Günther)

SPECIMENS EXAMINED: The Dutchman, 1; Walanippi, 7 miles SE. of Whitemark, 2.

SPECIMENS OBSERVED: Nil.

LITERATURE RECORDS: Babel, Fisher and Flinders Islands, Furneaux Group (MacKay 1955).

Denisonia superba (Günther)

SPECIMENS EXAMINED: Nelson Lagoon, 7 miles N. of The Dutchman, 1; 5 miles SE. of Whitemark, 1; 3½ miles N. of Loccota, 5.

SPECIMENS OBSERVED: 2 miles N. of Whitemark, 1 DOR; 2 miles N. of Loccota, 1 DOR; Lady Barron, 1 DOR.

LITERATURE RECORDS: Fisher, Big Dog, Little Green and Flinders Islands, Furneaux Group (MacKay 1955); Great Dog and Flinders Islands, Furneaux Group (Worrell 1963a); Flinders Is. (Zeitz 1914).

Notechis ater (Kreffit)

SPECIMENS EXAMINED: Chappell Is., Furneaux Group, 1 (Specimen D8674 National Museum).

SPECIMENS OBSERVED: 3 miles S. of The Dutchman, 1 DOR.

LITERATURE RECORDS: Cat Is., Furneaux Group (Cashion 1959 as *Notechis scutatus niger*); Chappell Is., Furneaux Group (Kellaway & Thomson 1932 as *Notechis scutatus niger*); Chappell Is., Furneaux Group (Kinghorn 1956 as *Notechis scutatus niger*); Babel Is., Furneaux Group (LeSouef 1902 as *Hoplocephalus curtus*); Chappell, Cat, Babel, Forsyth and Flinders Islands, Furneaux Group (MacKay 1955 as *Notechis scutatus*); Chappell Is., Furneaux Group (Worrell 1958 as 'Black Tiger Snake'); Babel and Chappell Islands, Furneaux Group (Worrell 1963a as *Notechis* sp.); Chappell Is., Furneaux Group (Worrell 1963b as *Notechis ater serventyi*); Babel and Chappell Islands, Furneaux Group (Worrell 1963c as *Notechis ater serventyi*); Flinders Is., Furneaux Group (Zeitz 1914 as *Notechis scutatus*).

DOUBTFUL LITERATURE RECORDS FOR FLINDERS ISLAND

ELAPIDAE

Demansia textilis (Duméril & Bibron)

RECORDS: Furneaux Group (Frost 1894 as *Diemenia superciliosa*).

Frost was not a member of the expedition to the Furneaux Group, and his report of five lines is not very specific. He makes no mention of the three common species of snakes (*Denisonia coronoides*, *D. superba* and *Notechis ater*); thus his record of *D. textilis* must be regarded as doubtful and probably attributable to *D. superba*.

II. KING ISLAND

SCINCIDAE

Egernia whitei (Lacépède)

SPECIMENS EXAMINED: Naracoopa, 3 (Specimens D1245, D2626-7 National Museum).

SPECIMENS OBSERVED: Nil.

LITERATURE RECORDS: King Is. (Lucas & Frost 1893).

TABLE 2
Reptilian distribution patterns in the Bass Strait area

Possible distribution patterns	Number of reptile species showing pattern
Victoria only	29
Victoria and Flinders Island	—
Victoria and King Island	—
Victoria and Tasmania	2
Victoria, Flinders and King Islands	—
Victoria, Flinders and King Islands and Tasmania	7
Victoria, Flinders Island and Tasmania	2
Victoria, King Island and Tasmania	—
Flinders and King Islands and Tasmania	1*
Flinders and King Islands	—
Flinders Island and Tasmania	2
King Island and Tasmania	—
Flinders Island only	—
King Island only	—
Tasmania only	—
TOTAL	43

* This species, *Notechis ater*, does not occur in southern Victoria; however it does occur on the Australian mainland in South Australia (Worrell 1963b) and Western Australia (Rawlinson MS.).

***Leiopisma entrecasteauxi* (Duméril & Bibron)**

SPECIMENS EXAMINED: Cape Wickham, 5 miles NNW. of Egg Lagoon, 2; Parenna, 3 miles W. of Naracoopa, 1; Naracoopa, 1; Seal Rocks, 4 miles SW. of Pearshape, 2.

SPECIMENS OBSERVED: Nil.

LITERATURE RECORD: Nil.

***Leiopisma metallicum* (O'Shaughnessy)**

SPECIMENS EXAMINED: 6 miles NW. of Currie, 1; Parenna, 3 miles W. of Naracoopa, 11; Yarra Creek, 2.

SPECIMENS OBSERVED: Nil.

LITERATURE RECORDS: Nil.

***Leiopisma trilineatum* (Gray)**

SPECIMENS EXAMINED: King Is., 2 (Specimens D2621 and D2624 National Museum).

SPECIMENS OBSERVED: Nil.

LITERATURE RECORDS: Nil.

***Tiliqua nigrolutea* (Quoy & Gaimard)**

SPECIMENS EXAMINED: 2½ miles E. of East Wickham, 1; Pegarah, 1; Pearshape, 1; Grassy, 1.

SPECIMENS OBSERVED: 1 mile N. of Egg Lagoon, 1 DOR; East Wickham, 1 DOR; Currie, 1 DOR; 6 miles E. of Currie, 1 DOR; 4 miles SE. of Currie, 2 DOR; Grassy Creek, 2 miles N. of Grassy, 1 DOR; Pearshape, 1 DOR; Grassy, 1 DOR; Seal Rocks, 4 miles SW. of Pearshape, 1 DOR; Surprise Bay, 1 DOR.

LITERATURE RECORDS: King Is. (LeSouef 1888 as *Cyclodus nigroluteus*); King Is. (Spencer 1888 as *Cyclodus gigantea*).

TABLE 3
Comparison of the Tasmanian and Gippsland reptile faunas

Family	Number of species in Tasmania	Number of species in Gippsland	Number of shared species
CHELONIA			
Chelyidae	—	1	—
LACERTILIA			
Agamidae	1	3	1
Scincidae	10	19	8
Varanidae	—	1	—
OPHIDIA			
Elapidae	3	7	2
TOTALS	14	31	11

ELAPIDAE

Denisonia coronoides (Günther)

SPECIMENS EXAMINED: Nil.

SPECIMENS OBSERVED: Pagarah, 1 DOR; Parenna, 3 miles W. of Naracoopa, 1 DOR.

LITERATURE RECORD: King Is. (LeSouef 1888 as *Hoplocephalus coronoides*).**Denisonia superba** (Günther)

SPECIMENS EXAMINED: 6½ miles E. of Loorana, 1; Parenna, 3 miles W. of Naracoopa, 3; Naracoopa, 1 juv.

SPECIMENS OBSERVED: 4 miles E. of Egg Lagoon, 1 DOR; East Wickham, 1 DOR.

LITERATURE RECORDS: King Is. LeSouef 1888 as *Hoplocephalus superbus*); King Is. (Worrell 1963a).**Notechis ater** (Krefft)

SPECIMENS EXAMINED: New Year Is. off King Is., 8 (Specimens D8540-1 and D9000-5 National Museum); Christmas Is., off King Is., 1 (Specimen D9006 National Museum).

SPECIMENS OBSERVED: Nil.

LITERATURE RECORDS: New Year Is. and Seal Rocks, King Is. (LeSouef 1888 as *Hoplocephalus curtus*); Christmas, New Year and King Islands (Worrell 1963a as *Notechis* sp.); Christmas, New Year and King Islands (Worrell 1963b as *Notechis ater humphreysi*); Christmas, New Year and King Islands (Worrell 1963c as *Notechis ater humphreysi*).

DOUBTFUL LITERATURE RECORDS FOR KING ISLAND

SCINCIDAE

Tiliqua scincoides (Shaw)RECORDS: King Is. (Spencer 1888 as *Cyclodus gigantea*); King Is. (Lucas & Frost 1893).Spencer refers to the large bluetongues and smaller skinks as being abundant. He mentions only *Cyclodus gigantea* in his report. As LeSouef in the same paper

records only *Cyclodus nigroluteus* (= *T. nigrolutea*) from King Is., it is clear that Spencer used the wrong name. Lucas & Frost almost certainly copied Spencer's mistake.

ELAPIDAE

Demansia textilis (Duméril & Bibron)

RECORDS: Ettrick River, King Is. (LeSouef 1888 as *Diemenia superciliosa*).

In his account of the Reptilia of King Is., LeSouef emphasizes the colour variations of the island snake species and in fact seems to have used body colour as a diagnostic feature. For example he appears to consider transverse banding a characteristic of the tiger snake (*N. ater*). LeSouef records island specimens of the copperhead (*D. superba*) as dark in colour, one or two being 'mistaken at first for black snakes' (*Pseudechis porphyriacus*). The present author found that island populations of *D. superba* included the common dark morph mentioned by LeSouef and also light brown and reddish brown variants. It seems probable that LeSouef's *D. superciliosa* was a light brown specimen of *D. superba*. Similarly the 'red water snake' he mentions was probably a reddish variant of *D. superba*.

NON-SPECIFIC REFERENCES

Hewer 1948:

Leiopisma metallicum; Tasmania and adjacent islands.

Tiliqua casuarinae; Tasmania and Tasmanian islands.

LeSouef 1888:

Hinulia (?) two spp.; King Is. (Probably *Leiopisma* spp., author).

McPhee 1962:

Tiliqua nigrolutea; Bass Strait islands.

Worrell 1963a:

Leiopisma ocellatum; Tasmania and adjacent islands.

Rhodona bougainvilli; Tasmania and Bass Strait islands.

Tiliqua nigrolutea; Tasmania and Bass Strait islands.

Discussion

As a result of this survey 4 species of reptiles are recorded from the Bass Strait islands for the first time: *Leiopisma pretiosum* on Flinders Is. and *Leiopisma entrecasteauxi*, *L. metallicum* and *L. trilineatum* on King Is. On the other hand 3 earlier species records have been shown to be of doubtful accuracy. *Demansia textilis* on Flinders Is. and *Tiliqua scincoides* and *Demansia textilis* on King Is. This leaves Flinders Is. with 12 definite species records and King Is. with 8 definite species records.

Altogether 43 species of reptiles have been considered. Their distributions in S. Victoria, Flinders Is., King Is. and Tasmania are summarized in Table 1. Table 2 shows that of 15 possible distribution patterns, only 6 actually occur. As mentioned in the introduction, these data can be discussed along four main lines to reach four separate, but related, conclusions. This is done under four headings:

1. Comparison of the reptile faunas of Flinders and King Islands.
2. Comparison of the reptile faunas of Flinders and King Islands with those of Tasmania and S. Victoria.
3. Comparison of the reptile faunas of Tasmania and S. Victoria.
4. Determination of the zoogeographic position of Tasmania.

Before starting the discussion proper, some points which arose during the collection of data should be clarified. Firstly, *Egernia luctuosa* is recorded from Victoria for the first time in Table 1. Mitchell (1950) in his revision of the genera *Egernia* and *Tiliqua* transferred *luctuosa* from the former to the latter genus. However, the present author has found that using Mitchell's definitions of these genera (based on head scalation, palatine bones and dentition) the previous arrangement is correct and accordingly the name *Egernia luctuosa* has been used in Table 1. Secondly, three other taxa used need further comment. Two are not Bass Strait island species and need only brief explanation; these are *Sphenomorphus* sp. nov. and *Denisonia* sp. nov. (see Table 1). Both taxa have apparently reached species status (Rawlinson, unpublished), the former being a member of the *Sphenomorphus quoyi* complex and the latter a member of the *Denisonia superba* complex, and both are apparently undescribed. The third taxon needing further comment is *Notechis ater*. Worrell (1963b) and the author (MS.) both consider that in E. Australia *Notechis scutatus* is restricted to the Murray-Darling river system, SE. Queensland, E. New South Wales, Victoria, SE. South Australia and E. Kangaroo Is. Worrell (*op. cit.*) regards *N. ater* as occurring in Tasmania, the Bass Strait islands, W. Kangaroo Is., all other South Australian offshore islands, the Yorke and Eyre Peninsulas and Flinders Ranges, South Australia. Worrell's usage of *N. ater* is here followed; however it is not considered that there are adequate grounds for recognition of subspecies (see Worrell 1963b and c in 'Literature records' for Flinders and King Islands). In addition the author (MS.) considers the Western Australian form to be referable to *N. ater*. Rawlinson (1966) has previously recorded Western Australian *Notechis* specimens as *N. scutatus*. A re-assessment of data on all *Notechis* populations for the present paper resulted in this subsequent change.

1. Comparison of the reptile faunas of Flinders and King Islands

Eight species of reptiles are known to occur on King Is. and all are shared with Flinders Is. and Tasmania (Tables 1 and 2). In addition, all reptile species occurring on King Is. have fairly extensive distributions on the Australian mainland: four species, *Egernia whitei*, *Leiopisnia metallicum*, *L. trilineatum* and *Denisonia coronoides*, occur in E. New South Wales, Victoria, South Australia and Western Australia; two species, *Leiopisnia entrecasteauxi* and *Tiliqua nigrolutea*, occur in E. New South Wales, Victoria and SE. South Australia; one species, *Denisonia superba*, in S. Victoria and SE. South Australia; and one species, *Notechis ater*, on the South Australian islands, Yorke and Eyre Peninsulas and Flinders Ranges, South Australia and S. Western Australia. Thus all the present King Is. species were apparently wide ranging during the last glacial period. This suggests that only the ecologically tolerant reptile species were able to utilize the W. side of the Bassian landbridge.

Twelve species of reptiles are known to occur on Flinders Is. and 8 species (discussed above) are shared with King Is. The remaining four species are all shared with Tasmania. Only two of these species are shared with the Australian mainland: one species, *Amphibolurus diemensis*, occurs in E. New South Wales and SE. Victoria; the other species, *Rhodona bougainvilli*, occurs in S. Victoria and South Australia. The two species not shared with the Australian mainland, *Leiopisnia ocellatum* and *L. pretiosum*, are endemic to Tasmania and the E. Bass Strait islands (Rawlinson, unpublished). Thus the four species occurring on Flinders Is. but not shared with King Is., were apparently of restricted distribution

during the last glacial period. This suggests that the E. side of the Bassian landbridge was generally more suitable as a corridor for reptiles.

From the above data it can be seen that there apparently was a difference between the E. and W. sides of the Bassian landbridge. On the basis of amphibian distributional data, Littlejohn & Martin (1965) made a similar observation. They concluded from a knowledge of the ecology of the species concerned that this difference indicated the W. side of the landbridge was wetter than the E. side. The reptile faunas of the two islands are generally similar and the differences observed are probably due to the much greater ecological diversity of the E. side of the landbridge. The present chain of granite outcrops from Wilson's Promontory to Tasmania shows that the unique habitats of the E. side would have been continuous down the landbridge.

2. Comparison of the reptile faunas of Flinders and King Islands with those of Tasmania and S. Victoria

King Is. has 8 species of reptiles (Table 1) and all are shared with Tasmania. Seven of the species are also shared with S. Victoria (*Notechis ater* being the absentee). From Table 1, it can be seen that 6 Tasmanian and 33 S. Victorian species of reptiles do not occur on King Is. This evidence indicates that the King Is. reptile fauna is allied to the present day Tasmanian reptile fauna.

Flinders Is. has 12 species of reptiles (Table 1) and all are shared with Tasmania. Nine of the species are also shared with S. Victoria (*Leiopisma ocellatum*, *L. pretiosum* and *Notechis ater* being the absentees). From Table 1, it can be seen that 2 Tasmanian and 31 S. Victorian reptile species do not occur on Flinders Is. This evidence indicates that the Flinders Is. reptile fauna is closely allied to the present day Tasmanian reptile fauna.

From the above data and Tables 1 and 2, it can be seen that while the reptile faunas of King and Flinders Islands bear a resemblance to that of S. Victoria, distributional evidence indicates that the island faunas arose from the same source allied to the present day Tasmanian reptile fauna.

3. Comparison of the reptile faunas of Tasmania and S. Victoria

Tasmania has 14 species of reptiles and 11 are shared with S. Victoria (Tables 1 and 2). Of the remaining three species, one (*Notechis ater*) is shared with the Bass Strait islands, South Australian islands and mainland, and Western Australian mainland; and the other two (*Leiopisma ocellatum* and *L. pretiosum*) are shared with Flinders Is. only.

Thus 29 of the 40 S. Victorian reptile species are not shared with Tasmania (or the Bass Strait islands). Consideration of the history of this area over the last 12,000 years as outlined by Littlejohn & Martin (1965) suggests that these 29 unshared species may be post-glacial intrusives into S. Victoria. However, the presence of a species in S. Victoria and its absence from Tasmania or the Bass Strait islands, is not really sufficient justification for classifying a species as a post-glacial intrusive. In general there are two reasons why a species presently occurring in S. Victoria but absent from Tasmania may not have been able to utilize the Bassian landbridge. In the first place, many S. Victorian reptiles are restricted to the far E. or far W. parts of the state and thus probably did not occur in the area of the landbridge. Secondly, the ecological preferences of some species may have prevented their southward expansion along the landbridge.

On this basis only 4 S. Victorian species may be classified as post-glacial intrusive elements with any degree of certainty. It is considered that if these species showed their present distributions when the landbridge was available, they would

have reached Tasmania. The 4 species in question are *Leiolopisma guichenoti*, *Siaphos maccoyi*, *Sphenomorphus quoyi tympanum* and *Notechis scutatus*, all of which are abundant across S. Victoria, and all also occur on Wilson's Promontory and Cape Otway.

The other 25 species occurring in S. Victoria but not in Tasmania are primarily forms whose main distribution lies outside S. Victoria. Their present distributions or habitat preferences would have excluded them from the Bassian landbridge. They may be classified as being of E. or W. origin according to whether the species concerned has a generally E. or W. distribution. For example, *Physignathus lesueuri*, being distributed down the E. coast of Australia into SE. Victoria, is of E. origin; *Amphibolurus barbatus*, being distributed throughout the inland arid regions of Australia into SW. Victoria, is of W. origin.

Fourteen E. and 11 W. forms, as defined above, were probably unable to use the Bassian landbridge. The E. group comprises: *Chelodina longicollis*, *Amphibolurus niuricatus*, *Physignathus lesueuri*, *Egernia cunninghami*, *E. saxatilis intermedia*, *Emoia spenceri*, *Leiolopisma mustelinum*, *L. weeksae*, *Sphenomorphus* sp. nov., *Tiliqua scincoides*, *Varanus varius*, *Denisonia nigrescens*, *Denisonia* sp. nov. and *Pseudechis porphyriacus*; and the W. group includes *Amphibolurus barbatus*, *Tympanocryptis lineata*, *Phyllodactylus marmoratus*, *Delma impar*, *Ablephaeus lineocellatus*, *Egernia luctuosa*, *Hemiergis decresiensis*, *Sphenomorphus lesueuri*, *Tiliqua rugosa*, *Demansia textilis* and *Denisonia flagellum*.

Thus it can be seen that while there has been a change in the reptile fauna of S. Victoria over the last 12,000 years, only 4 species can be listed as post-glacial intrusives with any confidence.

4. Determination of the zoogeographic position of Tasmania

In order to determine the zoogeographic affinities of Tasmania and the Bass Strait Islands, their reptile fauna should be compared with that of an area of known zoogeographic composition. Rawlinson (1966) has demonstrated that Gippsland (SE. Victoria) is a typical Bassian area. Comparison of the Tasmanian reptile fauna with that of Gippsland may therefore reveal its zoogeographic position.

There are 14 species of reptiles in Tasmania (Tables 1 and 3). Eleven of these species are shared with Gippsland which has 31 species. The shared species are: *Amphibolurus diemensis*, *Egernia whitei*, *Leiolopisma delicata*, *L. entrecasteauxi*, *L. metallicum*, *L. trilineatum*, *Rhodona bougainvilli*, *Tiliqua casuarinae*, *T. nigrolutea*, *Denisonia coronoides* and *D. superba*.

Seven genera of reptiles occur in Tasmania and all are shared with Gippsland which has 16 genera. The shared genera are: *Amphibolurus*, *Egernia*, *Leiolopisma*, *Rhodona*, *Tiliqua*, *Denisonia* and *Notechis*.

Three families of reptiles occur in Tasmania and all are shared with Gippsland which has 5 families (Table 3). The shared families are: *Agamidae*, *Scincidae* and *Elapidae*.

In summary, it can be seen that 79 per cent of the species, 100 per cent of the genera and 100 per cent of the families of reptiles in Tasmania also occur in Gippsland. Thus there are great similarities between the reptile faunas of these two areas and, as Tasmania has only two truly endemic species (*Leiolopisma ocellatum* and *L. pretiosum*), it must be considered as zoogeographically allied to mainland SE. Australia. Following Rawlinson (1966), the Tasmanian and Bass Strait island reptile faunas are Bassian in nature.

Conclusions

From the preceding discussion and Tables 2 and 3, it is possible to draw four conclusions:

1. The E. side of the Bassian landbridge present during the last glacial period provided a more favourable habitat for reptiles than the W. side.
2. The present day reptile faunas of Flinders and King Islands were derived from the same source as the present day Tasmanian reptile fauna.
3. At least four of the present day S. Victorian reptile species are post-glacial intrusives.
4. The Tasmanian and Bass Strait island reptile faunas may be classified as Bassian (*sensu* Rawlinson 1966).

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References

- CASHION, T., 1959. Preliminary notes on *Notechis scutatus niger*, Kinghorn, on Cat Island, Furneaux Group. *Pap. and Proc. Roy. Soc. Tas.* 93: 111.
- FROST, C., 1894. Reptilia, in Gabriel, F. L. S., Report of expedition to Furneaux Group. *Vict. Nat.* 10: 167-184.
- GREEN, R. H., 1965. Two skink lizards newly recorded from Tasmania. *Rec. Queen Victoria Mus. Launceston*, N.S. 19: 1-4.
- HEWER, A. M., 1948. Tasmanian lizards. *Tasmanian Nat.* 1: 8-11.
- KELLAWAY, C. H. and THOMSON, D. F., 1932. Observations on the venom of a melanotic insular variety of the Tiger Snake (*Notechis scutatus*). *Aust. J. Exp. Biol. and Med. Sci.* 10: 35-48.
- KINGHORN, J. R., 1921. Studies in Australian reptiles No. 2. *Rec. Aust. Mus.* 13: 143-150.
- , 1956. *The Snakes of Australia*. Angus and Robertson, Sydney.
- LE SOUEF, D., 1888. Reptilia in Campbell, A. J., Report of expedition to King Island, 1887. *Vict. Nat.* 4: 129-164.
- , 1902. A visit to the Furneaux Group of Islands. *Ibid.* 18: 181-188.
- LITTLEJOHN, M. J. and MARTIN, A. A., 1965. The vertebrate fauna of the Bass Strait Islands. I. The amphibia of Flinders and King Islands. *Proc. Roy. Soc. Vict.* 79: 247-256.
- LUCAS, A. H. S. and FROST, C., 1893. The lizards indigenous to Victoria. *Ibid.* 6: 24-92.
- MACKAY, R. D., 1955. Notes on a collection of reptiles and amphibians from the Furneaux Group of Islands, Bass Strait. *Austr. Zool.* 12: 160-164.
- MAIN, A. R., 1961. The occurrence of *Macropodidae* on islands and its climatic and ecological implications. *J. Roy. Soc. W. Aust.* 44: 84-89.
- MC PHEE, D. R., 1959. *Snakes and Lizards of Australia*. Jacaranda Press, Brisbane.
- MITCHELL, F. J., 1950. The scincid genera *Egernia* and *Tiliqua*. *Rec. S. Aust. Mus.* 9: 275-308.

- RAWLINSON, P. A., 1965. Snakes of the Melbourne area. *Vict. Nat.* 81: 245-254.
- , 1966. Reptiles of the Victorian Mallee. *Proc. Roy. Soc. Vict.* 79: 605-619.
- , MS. The taxonomy and distribution of the Australian Tiger Snakes (*Notechis* spp.).
- SPENCER, W. B., 1888. Narrative in Campbell, A. J., Report of expedition to King Island, 1887. *Vict. Nat.* 4: 129-164.
- , 1892. The fauna and zoological relationships of Tasmania. Presidential address, Section D, Australian Association for the Advancement of Science, Hobart. *Report A.A.A.S.* 4: 82-124.
- WAITE, E. R., 1929. *The Reptiles and Amphibians of South Australia*. S. Aus. Govt. Printer, Adelaide.
- WORRELL, E. R., 1958. *Song of the Snake*. Angus and Robertson, Sydney.
- , 1963a. *Reptiles of Australia*. Angus and Robertson, Sydney.
- , 1963b. Some new Australian reptiles. Part I. Two new subspecies of the elapine Genus *Notechis* from Bass Strait. *Aust. Reptile Park Records* 2: 2-11.
- , 1963c. *Dangerous Snakes of Australia and New Guinea*. Angus and Robertson, Sydney.
- ZEITZ, F. R., 1914. The reptiles of Flinders Island, Bass Strait. *Vict. Nat.* 31: 36.